Degree competences to which the subject contributes

Specific:
13340. Apply scientific concepts to environmental problems and their correlation with technological concepts.
13347. Dimension unconventional systems and advanced treatment and raise their mass balance and energy.

Teaching methodology

The course consists of 3 hours per week of classes in which the teacher explains the concepts and basic materials, presents examples and exercises. Exercises are also performed to consolidate the course. Support materials are provided through the virtual campus ATENEA.

Learning objectives of the subject

CE01 - Apply scientific concepts to environmental problems and their correlation with technological concepts.
CE08-Dimension unconventional systems and advanced treatment and raise their mass balance and energy.

Explore scientific concepts and technical principles of quality management of the receiving means, atmosphere, water and soil, and applied to problem solving.
Explore scientific concepts and technical principles of management and treatment of gaseous emissions, water supply, sewage and waste and remediation techniques for groundwater and contaminated soils.
Sized systems for the treatment of major pollutants vectors in specific sectors of activity.
Interprets rules, identifies goals, assesses technical alternatives proposed unconventional solutions and priority actions.

Introduction: Air pollutants arising from energy generation processes, primary and secondary pollutants, characteristics.
Concepts of emission and immission. Legislation.
Treatment systems to reduce the emission of grit and dust: Types of treatments. Treatments for dry process. Wet treatments.
Treatment systems to reduce greenhouse gas emissions: absorption. Condensation.
Catalytic and non-catalytic combustion.
Classification of radioactive waste. Waste management of low and intermediate level. Application example.
Management of high level waste: description of the multi-barrier system. Analysis of long-term safety. Natural analogues
Cigar Lake, El Berrocal, Oklo.

Acquire scientific knowledge of concepts and technical principles of quality management of media receivers, air, water
and soil, and apply it to problem solving. Acquire scientific knowledge about concepts and principles of technical systems
management and treatment of exhaust gases, water and waste. Build up of remediation systems. Interpretation of
standards, goal identification, evaluation of technical alternatives, unconventional solutions and priority
actuacions. Introduction: Atmospheric pollutants resulting from energy generation processes, primary and secondary
pollutants in a selective way, catalytic and non-catalytic. Treatment systems to reduce the emission of particles and dust:
Catalytic combustion and non-catalytic. Waste management.

<table>
<thead>
<tr>
<th>Study load</th>
<th>Total learning time: 125h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 19h 30m</td>
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<tr>
<td></td>
<td>Practical classes: 9h 45m</td>
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<td></td>
<td>Laboratory classes: 9h 45m</td>
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<td></td>
<td>Guided activities: 6h</td>
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<td></td>
<td>Self study: 80h</td>
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# 250680 - ENEMEDAMB - Energy and Environment

## Content

<table>
<thead>
<tr>
<th><strong>Current energy system and environmental impact</strong></th>
<th><strong>Learning time:</strong> 24h</th>
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</thead>
</table>
**Practical classes:** 2h  
**Self study:** 14h |
| **Specific objectives:** Knowing the different energy sources, energy carriers and devices interconversion of energy; Understand the impact of the acquisition and use of energy to the environment; become familiar with the techniques of capture and use of CO2. Learn the different physical and chemical methods of using CO2. | |

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<tr>
<th><strong>New technologies</strong></th>
<th><strong>Learning time:</strong> 60h</th>
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</table>
**Practical classes:** 5h  
**Self study:** 35h |
| **Specific objectives:** Become familiar with catalysis and its importance in processes related to the transformation of energy; understand the principles and methods of the "green engineering". Evaluate different routes for the conversion of biomass and biofuels; adopt criteria to different interconversion pathways of energy and use of energy carriers. | |

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<tr>
<th><strong>Evaluation</strong></th>
<th><strong>Learning time:</strong> 9h 36m</th>
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<tr>
<td><strong>Learning time:</strong> 9h 36m</td>
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</table>
| **Laboratory classes:** 4h  
**Self study:** 5h 36m |

## Qualification system

The mark of the course is obtained from a course project (40%) and a final exam (60%).
Regulations for carrying out activities

Both the course project and the exam are required.

Bibliography

Basic:


Complementary:
